

In the spectra of some of the July meteors a red line was also observed, but a blue one was looked for in vain; yet the professor would not deny that the red line in question may have been a potassium line and that the blue  $K\beta$  was simply overlooked on account of its extreme weakness.

The meteors observed on August 12 and 13 resembled those observed in July in almost all details. Thus a yellow meteor of the first magnitude was observed, which evidently originated from the Perseus radiating point. In the spectrum of the head of this meteor, besides the bright sodium line, the lithium lines were distinctly visible; three seconds later another meteor of about the second magnitude passed through the field of the spectroscopic in a direction exactly parallel to the former one, and the spectrum of both head and tail in this case was simply a tolerably bright continuous one, without any appearance even of the bright sodium line.

At 10h. 46m. 10s. Prof. von Konkoly saw a magnificent meteor in the north-eastern sky; it moved very slowly, its colour was emerald green, its brilliancy equal to that of Jupiter; he at once directed his spectroscopic towards it. At the first appearance the head showed the sodium line only, but soon a number of lines were seen in the green and blue, of which one was recognised as a magnesium line, while others were suspected to be copper lines. There were also two faint lines visible in the red. On August 14 several other meteors were observed with the spectroscopic, but only one was seen in the spectrum of which a faint red line appeared besides the sodium line; of these meteors several were of the first magnitude and did *not* show the sodium line; other ones of a lesser magnitude showed the sodium line very brightly besides a continuous spectrum more or less brilliant.

At the same observatory two stationary meteors were observed: one by Capt. von Reviczky on July 26, at 11h. 48m. O-Gyalla mean time (position: 2h. 0m. R.A. and 29° 0' decl. N., magnitude 3); the other by Herr J. Rosenzweig, the assistant at the observatory, on August 11 at 9h. 47m. 1s. O-Gyalla mean time (position: 2h. 14m. R.A. and 55° 18' decl. N., magnitude 3).

The total numbers of shooting stars of the two showers referred to, which were observed at O-Gyalla were as follows:—

						Meteors.
July	25	...	...	...	...	72
"	26	...	...	...	...	87
"	28	...	...	...	...	26
August	11	...	...	...	...	110
"	12	...	...	...	...	50
"	13	...	...	...	...	50
"	14	...	...	...	...	35

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

THE Calendar of the Yorkshire College for the sixth session (1879-80) has just been published. It appears this year for the first time in stiff covers, and with the prospectus of the Leeds School of Medicine makes a book of 204 pages. The growth in the size of the calendar corresponds with the extension of the College curriculum, for several new classes are announced for the approaching session, which begins on October 7 next. Mr. W. Philp, M.A., B.Sc., has been appointed mathematical and classical tutor, and the College authorities have thus been able to arrange for a systematic oversight of students who are preparing for the examinations of the University of London. The Natural Philosophy lectures are now arranged in two courses. The first year's course comprises the requirements for London Matriculation, viz., Mechanics, Optics, and Heat; the second year courses, those for the B.A. and other degrees, viz., Mechanics, Heat, Acoustics, Light, Electricity, and Magnetism. The Chemistry Classes remain the same as last year. Students have the privilege of pursuing a course of practical chemistry in the laboratory at times convenient to themselves, and for such periods as they are able to devote to that study. The Saturday morning chemistry lecture and practical class are to be continued, schools and teachers having largely availed themselves of this opportunity in past sessions. The arrangements and the classes in Mathematics, Geology and Mining, Biology, Zoology and Comparative Anatomy, Botany, Civil and Mechanical Engineering, Latin, Greek, French, German, Oriental Languages, Coal Mining, and Textile Industries remain for the most part unaltered, but the important subject of Mental and Moral Science has been added, Logi-

being taken in the earlier part of the session, and Psychology in the later part. The classes in Modern Literature and History have been multiplied and rearranged, so as to give a complete course in Literature and History for the London Matriculation and 1st B.A. examinations, a complete course on the special subjects in Literature and History for the Cambridge Higher Local examination, and a course of History for the Cambridge Senior and Junior Local examinations, besides other classes for students not reading for examinations. The fees in some of these classes are fixed on a very low scale, to meet the requirements of teachers and others preparing for the University Local examination. This is an endeavour to extend the usefulness of the college, which will, no doubt, be warmly appreciated by the large class of persons directly affected by it. The department of Textile Industries continues to receive the attention it deserves, and although the students cannot be located in their new premises at Beech Grove at the opening of the Session, as had been hoped, their interests have been amply provided for in the temporary class rooms and in the weaving annexe in Cookridge Street. The practical value of the instruction given by Mr. Beaumont is widely recognised, and we observe that the committee are doing what they can to impress on the students in this department the value of a thorough acquaintance with the most important branches of textile manufacture. Arrangements for the establishment of a school of dyeing are in an advanced state. In the evening classes there are to be courses of lectures on Mechanics, Chemistry, Geology, Biology, Botany, and Engineering, and classes in Latin, Greek, English Grammar, and Textile Industries. A somewhat bold experiment is to be tried by the introduction of two short courses of lectures of a more popular character than the ordinary evening class lectures.

MR. T. JEFFERY PARKER, B.Sc., Demonstrator of Biology in the Royal School of Mines, has been appointed to the new lectureship on Biology at Bedford College, York Place, Portman Square.

THE City and Guilds of London Institute for the Advancement of Technical Education have issued a detailed programme of subjects in which examinations will be held in 1880. It embraces a great variety of subjects, in the more scientific of which some eminent men of science have been obtained as examiners. Any one interested in the matter will, no doubt, obtain a copy of the programme by applying to the Secretary, Mercers' Hall, E.C.

M. JULES FERRY has published a regulation tending to diminish the importance given to the *Compositions des Prix* in the several French educational establishments and to shorten the time assigned to the young competitors for writing their essays. Much dissatisfaction is felt by teachers and the best pupils at Government trying to repress the sense of emulation. It is expected that petitions will be sent to the French Parliament protesting against the supposed retrograde step taken by the Administration.

### SCIENTIFIC SERIALS

*Annalen der Physik und Chemie*, No. 7.—In the opening paper, on electric limiting layers, Prof. Helmholtz studies the case where there is a difference of potential at the limiting surface of two different bodies, giving, along this surface, what he calls an "electric double layer," as, e.g., when a zinc and a copper plate, in metallic connection, are approximated to each other. He groups together, in this relation, the phenomena of metallic electrodes in an undecomposed electrolyte, frictional electricity, flow of liquids on solids, and applies an explanation of the last-named case to various recorded phenomena of electrical action in liquids.—Herr Beetz describes a new investigation of the heat-conducting power of various liquids. The differences in this property, according as the temperatures were above or below 20°, are made manifest, and the discrepancies of previous data in part explained. The phenomena of heat conduction in liquids are considered to depend on mechanical molecular processes, or friction phenomena, as Kohlrausch has shown to be the case with electrolytic conduction.—A paper by Herr Barus treats of the thermo-electric position and electric conductivity of steel in its relation to hardening. He shows that the steel bars examined fell into two classes, those of the one class (the harder) being electro-negative to copper, those of the other (the softer) electro-positive. A simple method of classing steel is deduced from this.—In a second communication on experimental determination of

the velocity of light in crystals, Herr Kohlrausch finds that also for oblique sections of optically biaxial crystal Fresnel's theory of light-motion in crystals is fully in harmony with observation.—Remaining papers:—On elastic reaction in longitudinal extension, by Herr Neesen.—Researches on the elementary law of hydro-diffusion, by Herr H. F. Weber.—On the magnetic behaviour of pulverised iron, by Herr V. Waltenhofen.—On extra currents in conductors of various thickness, by Herr Herwig.

No. 8.—The transpiration of vapours is here the subject of a paper by Herr L. Meyer, whose method of experiment was to heat the substance under determinate regulated pressure to boiling, and let the vapour play over the capillary tube, and partly stream through into a vacuous cooled space, where it was condensed and after some time measured as liquid. Herr Meyer finds, *inter alia*, that the friction of vapour increases with rising temperature and faster than that of gases; further, the molecular volume in the vapour state, as in gases, seems to be greater at a low than at a high temperature.—In a lengthy (third) paper on the electric conduction of gases, Herr Hittorf describes many interesting effects obtained with a Bunsen battery of 1,600 elements. This gave him within wide limits, a constant glow discharge. He has no doubt that the character of phosphorescent light is to be attributed to the spectra of the first order. All non-metallic gases, whether elementary or compound, can probably be thrown into the phosphorescent state by the electric current giving such spectra. The electric behaviour of flame gases is different from that of the same gases at the same temperature, when not involved in the chemical process. In the glow-discharge, the author considers, there is not a transference of gas particles; and the propagation of the current everywhere (including the dark layers and space) is effected by a different process. The molecules of a gas have a real conductivity, like the particles of metals and electrolytes, inasmuch as they discharge in every direction the least difference of tension. The author supports, by experimental evidence, Faraday's views of the nature of discharge.—A peculiar spark discharge at the so-called negative pole of an induction apparatus is studied by Herr Hankel; there being a blunt point at the negative pole, and a plate or large ball at the positive, positive electricity may (by reason of oscillations in the coil), spring over from the point to the plate or ball in long sparks.—Remaining papers: Researches on the elementary law of hydro-diffusion (continued), by Herr H. F. Weber.—On the change of phase of light by reflection, by Herr Glan.—On the density of the luminous ether, by the same (the lower limiting value he assigns is 7,416 times that of Thomson).—The law of dispersion, by Herr Kettler.—The oxygen spectrum, by Dr. Schuster.—Generalisation of a theorem of attraction, by Herr Schallbach.—Contributions to a history of natural sciences among the Arabs, by Herr Wiedemann.

THE *Sitzungsberichte der königl. böhmischen Gesellschaft der Wissenschaften in Prag* (Jahrg. 1877 and 1878) contain the following papers of interest:—On the prehistoric vertebrate fauna of Bohemia, by Prof. Anton Fric.—On the recent history of botany, by Herr Ladislav Celakovsky.—On a new spectrometrical method, by Prof. K. V. Zenger.—On the bases of iconognosy, by Prof. F. Tilser.—On the gas-coal fauna of Zabor near Schlan, Kroucova near Renc, and Tremosna near Pilsen, and on the sphærosiderite balls of Zilov, by Dr. Anton Fric.—On the calculation of aplanatic katadioptric object glasses, by Prof. K. V. Zenger.—Several mathematical papers by Prof. Emil Weyr.—On some new microscopical and chemical methods for the determination of certain minerals, particularly of feldspars, if they occur in very minute fragments or sections, and on the phenomena apparent in etched, natural, and ground surfaces of apatite, by Prof. Dr. Emanuel Borický.—On the discovery of *Placoparia Zippei*, Corda, at the foot of the Lorenzi hill at Smichov near Prague, by Prof. Josef Korensky.—On the discovery of a tooth of *Hyena spelæa* in the diluvial deposits of Hlubocerp.—Several mathematical papers by Prof. Franz Studnicka, Karl Zahradnik, and Josef Solin.—Critical remarks on Wigand's "Darwinismus" concerning the differences of Darwin's doctrine of descent and the "Genealogie der Urzellen," by Prof. Lad. Celakovsky.—On the distribution of vertebrates in ancient and recent geological periods, by Dr. Johann Palacky.—On species, forms, and hybrids of *Pilosella*, a subgenus of *Hieracium*, by Dr. Knaf.—On a new solar eye-piece and on a new position micrometer, by Prof. K. V. Zenger.—On the triple change of generation of plants, by Prof. Lad. Celakovsky.—On a new saurian from the limestone of the Permian formation of Braunau

(Bohemia), by Prof. Anton Fric.—On the results of ombrometrical measurements made in Bohemia, particularly with reference to the meteorological net, by Prof. Fr. Studnicka.—On the international horticultural exhibition of Amsterdam, by Prof. Dr. M. Willkomm.—On a theorem of the potential theory, and on steel magnets, by Prof. A. von Waltenhofen.—On the south-eastern border of the European flora, by Dr. Johann Palacky.—A series of mathematical papers, by Franz Zrzavy, Gustav Schmidt, S. Günther, Wilhelm Matzka, Gust. Gruss, Gottlieb Becka, and S. Kantor.—New researches on compound fluorides by Prof. Fr. Stolba.—On the anatomy and systematics of *Enchytrida*, by Dr. F. Vejdorsky.—On the porphyries of the Libicec rock, by Prof. E. Borický.—Analysis of the Moldau water, by Prof. A. Belohoubek.—On the theory of twin crystals, by Prof. J. Krejci.—On dioxalate of rubidium and its preparation from rubidium alum, by Prof. F. Stolba.—On the survey of the iron-ore mountains in the Chrudim and Caslau districts in Bohemia, by Prof. J. Krejci.—On the relation existing between certain fossil floræ and land-faunæ, and between them and the simultaneous marine faunæ, in India, Africa, and Australia, by Dr. Otakar Feistmantel.—On the variability of *Carabus Scheidleri*, Fabricius, by Jos. Korensky.—On some hydrometrical researches and apparatus, by Prof. R. A. Harlachner.—On a peculiar formation of loops in the cerebral and spinal blood vessels of saurians, by Dr. Josef Schoebel.—On some new vegetable bastards in the Bohemian flora, by L. Celakovsky.—On two new Epilobieæ, bastards in the Bohemian flora, by K. Knaf.—On the capillaries in the mucous membranes of the throat of naked amphibia, with report on a new method of performing injections, by Jos. Schöbl.—On the combination of chlorine with cymol at boiling heat, by B. Raymann.—On the blood vessels of the eyes of cephalopoda, by Jos. Schöbl.—On the origin and period of storms, by K. Wj Zenger.—On the deposits of iron ores in the Silurian formation of Bohemia, by K. Feistmantel.—On a new quercitrine sugar, by K. Krus.—On the travelling routes of migratory birds in Asia, by Joh. Palacky.—Results of the analysis of the Szazava water, by A. Belohoubek.—On the conglomerates of the so-called iron-ore mountains, by Joh. Krejci.—On the Bohemian tertiary flora, by the same.—On the elevation of Carlsbad and its surroundings above the sea level, by K. Koristka.—On the results of some experiments made with a view of growing plants in artificial soils and extending over two years, by F. Farsky.—On some compounds obtained from cholesterine, by R. Preis and B. Raymann.—On the action of iodine upon aromatic compounds, by the same.—On orthobromo-benzaldehyde, by the same.—On the action of fluoride of silicon upon organic hydroxyl compounds, by the same.—On two sulphosalts of chromium, by the same.—Observations on the reduction formulae, converting Miller's symbols of the isoclinic system into Naumann's symbols of the hexagonal system, by J. Krejci.—On the employment of oxalate of lead for determining the tenor of Chamæleon solution, by F. Stolba.—On the employment of glass tubes for decomposing steam by means of red-hot iron, by the same.—On the Moravian lepidolite, by the same.—On the separation of cæsium and other alums by means of crystallisation, by the same.—On the preparation of compounds of didymium and lanthanum free from cerium, by the same.

THE *Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg* (tome xxv., No. 4) contains the following papers of importance:—Observation of the passage of Mercury across the sun's disk on May 6, 1878, by A. Sawitsch.—Histological researches on the smaller brain of *Petromyzon fluviatilis*, by A. Jeleneff.—Researches on the Jurassic flora of Russia, by J. Schmalhausen.—On the action of light upon the irritability of the skin of the common frog, by N. Wedensky.—Enumeration of all the Salsolaceæ hitherto found in Mongolia, by Al. Bunge.—General observations on comets, by Th. Bredichin.—Observations of Uranus and Neptune during 1878, by A. Sawitsch.—On the nitro-compounds of toluol, by J. Barsilowsky.—Preliminary communication regarding the appearance of Encke's comet during 1878, by O. Backlund.

THE *Verhandlungen des k.k. geologischen Reichsanstalt* (No. 11, 1879, Vienna) contain the following papers:—On some eruptive rocks from Bosnia, by C. von John.—Researches on the flora of the diatomaceæ-slates of Kutschein, near Bilin, by Johann Sieber.—Notes on some Austrian minerals, by Rudolf Scharizer. The minerals treated of are columbite (tantallite) serpentine, pyrope and pseudomorphous garnet.—On the quaternary formation in Thracia, by A. M. Petz.—On the black porphyry from the



Hallstadt Salt Mountain, by Fr. von Hauer.—Travelling sketches from Bosnia (Travnik), by Dr. Edmund von Mojsisovics.—Another sketch, describing the route from Serajevo to Mostar, is by Dr. A. Bittner; and a third one, on the route from Vares to Zwornik, by Dr. E. Tietze.—On some ammonites from the Carpathian sandstone, by C. M. Paul.

## SOCIETIES AND ACADEMIES

### PARIS

Academy of Sciences, September 15.—M. Daubrée in the chair.—The following papers were read:—On linen cloths dyed bluish black, with the intention of replacing the indigo blue cloths employed in the uniforms of the French army, by M. Chevreul. The blue matter in certain military cloths examined, he is able to say is neither indigotine, nor Prussian blue, nor ultramarine; it may be from aniline, and he is inquiring into this.—Experiments tending to demonstrate the compound nature of phosphorus, by Mr. J. N. Lockyer. Phosphorus heated in a tube with copper gives a gas which shows the spectrum of hydrogen very bright. Phosphorus alone, heated in a Sprengel vacuum tube, gives nothing. Fixed at the negative pole in a similar tube it gives very abundantly a gas which shows the spectrum of hydrogen, but which is not  $\text{PhH}_3$ . The author also describes experiments with sodium, magnesium, lithium, &c.—Researches on erbine, by M. Lecoq de Boisbaudran. The lines of M. Cleve's holmium are precisely those indicated by M. Soret as characteristic of his earth  $X$ , and the two substances are evidently identical.—The Minister of Agriculture and Commerce called attention in a letter to the common adulteration of olive oil with oils of different sources, and desired the Academy to indicate a practical means of detecting such fraud, which is very prejudicial to cultivation of the olive.—Observations of Hartwig's comet and Palisa's comet, at the Paris Observatory, by MM. Henry.—Observations of the sun during the second quarter of 1879, by Signor Tacchini. A certain increase in the energy of solar phenomena is perceptible. The hydrogenic protuberances were about equally distributed to the north and to the south (instead of nearly all in the boreal hemisphere, as in the previous quarter). The maximum of frequency is between parallels  $30^\circ$  and  $60^\circ$  in both hemispheres. The preponderance of protuberances in the northern hemisphere seems characteristic of the minimum of solar activity. The maximum of frequency of faculae is found between parallels  $10^\circ$  and  $30^\circ$  in each hemisphere. The author considers we passed the minimum of solar activity in the beginning of this year. A metallic eruption was observed on June 19.—On the spectra of earths forming part of the group of yttria. A claim of priority with regard to what M. Cleve observed.—Determination of organic nitrogen in natural waters, by M. Pellet. He describes a method which is simpler than that given by M. Lechartier recently.—On the oxidising action of cupric oxide, transformation of acetic acid into glycolic acid, by M. Cazeuueve.—New experiments on the mode of action of chloral regarded as an anæsthetic, by M. Arloing. He concludes that chloral is decomposed into chloroform and alkaline formiates in the blood of animals; that the anæsthetic effects are due to chloroform; and that the alkaline formiates mechanically favour their production by increasing the velocity of the circulation, and thus facilitating the impregnation of the nervous elements by the anæsthetic agent.—M. Wolf's "History of Swiss Geodesy" was presented.

### VIENNA

Imperial Academy of Sciences, June 19.—The following among other papers, were read:—On the products of decomposition from albuminoids through action of oxymuriatic acid, by Herr Horbaczewski.—Researches on the influence of illumination on penetration of radicles into the ground, by Herr Richter.—On some fresh-water fish of South America, by Dr. Steindachner.—South Japanese annelids, by Dr. Marenzeller.—Observations of refraction on several summits, by Herr von Sterneek.—Fauna of the lias brachiopod line of Sospirolo, near Belluno, by Dr. Uhlig.—Brachiopod fauna of the oolite of Balin, near Krakaw, by Herr Sjaknocha.

July 3.—Prof. Brühl presented the first thirteen parts of his Zootomia of all animal-classes.—On some plane rational curves of the fourth order, by Herr Bobek.—On a direct measurement of the work of induction, and a determination therefrom of the mechanical equivalent of heat, by Prof. von Waltenhofen.—On a peculiar mode of producing the orthogonal hyperboloids, &c., by Herr Ruth.—On the crystallisable constituents of corallin, by

Herr Zulkowsky.—On continued fractions, by Prof. Gegenbauer.—On the phosphorescence produced by electric rays, by Herr Goldstein.—On some consequences of the Young-Helmholtz theory, by Herr von Brücke.—Prehistoric settlements and burial places in Krain, by Herr von Hochstetter and Herr Deschmann.—On the radiometer, by Dr. Puluj.

July 10.—Prof. Fric presented a part of his work on fauna of gas-coal and limestone of the Permian formation in Bohemia.—On the behaviour of the bacillus of splenic inflammation under extreme low temperatures, by Prof. Firsch.—Researches on the mechanical behaviour of the acinus glands, by Prof. Stricker and Dr. Spina.—Researches on the structure of the envelope of the cerebrum, by Prof. Stricker and Dr. Unger.—Comparative anatomy of the wood of Ebenaceæ and their allies, by Herr Molisch.—Chemical studies on pemphigus, by Dr. Jarisch.—On glycyrrhizin, by Dr. Habermann.—On some derivatives of dimethylhydrochinon, by Herr Kartot.—On the crystalline structure of apophyllite, by Prof. Rumpf.—On the double formation and optical properties of chabasite, by Herr Becke.—On the camphene of borneol and camphor, by Herr Kachler and Herr Spitzer.—On homocinchonidine, by Herr Skraup.—On chinine, by the same.—On Gay Lussac's hypochloronitric acid, by Herr Goldschmidt.

July 17.—Researches on the liverworts, by Prof. Leitgeb (treating of "Anthocerotæ").—On the cause of excitation of electricity on contact of heterogeneous metals, by Dr. Exner.—Studies on the development of ferns, by Prof. Leitgeb.—On the distribution of arsenic in the animal organism after ingestion of arsenious acid, by Prof. Ludwig.—Contribution to a knowledge of the action of the *nervus vagus*, by Herr Wagner.—On the constitution of cinchonine and cinchonidine, by Dr. Skraup.—Observations on the differences of the two electric states, by Herr Doubrawa.—On the velocity of propagation of sound in tubes, by Dr. Tumlriz.—On the magnetisation of iron rings, by Prof. v. Ettingshausen.—Contributions to a knowledge of elastic reaction, by Prof. Streintz.—On nephrite and bowenite from New Zealand, by Dr. Berwerth.—On the optical orientation of plagioclase, by Herr Schuster.—On new and rare fishes, by Dr. Steindachner.—On idrialine, by Dr. Goldschmidt.—On nitroprussides, by Herr Bernheimer.—On direct introduction of carboxyl groups into phenols and aromatic acids, by Herr Senhofer and Herr Brunner.—Geological observations in the region of the Thessalian Olympus, by Herr Neumayer.—Ditto in the north-east and south-west of the Peninsula of Chalcidice, by the same, and by Herr Burgerstein.—Geological formation of the Island of Cos, &c., by Herr Neumayer.—New researches on cerebral ganglions and the med. obl., by Dr. Meynert.

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